REMARKS

Claims 1-10, 12-30, 32-39, 41-43 and 46 are all the claims pending in the application. By this amendment, dependent claim 11 has been canceled.

Claims 1 14, 29, 34, and 46 are independent claims.

Objections/Informalities

The action points to minor informalities in claims 27 and 33. Applicant thanks the Examiner for finding these informalities and has modified these claims in the manner suggested by the Examiner.

Claim Objection

Claim 34 is objected to because of informalities. Applicant has provided line indentation, as requested by the Examiner.

Claim Rejections Under 35 U.S.C. § 112, first paragraph

Claims 1-38, 41 and 42 are rejected under 35 U.S.C. § 112, first paragraph.

Although Applicant disagree with the Examiner, Applicant has amended the claims so that they use the original claim term "generating."[1]

Applicant also points out with respect to the Examiner's comments regarding transmitting signals, that that this application does not include any claims directed to a signal itself.

[1] See at least paragraph [0145] of US2007/0084286.

Claim Rejections Under 35 U.S.C. § 112, second paragraph

Claims 29, 30, 32, 33 and 43 are rejected under 35 U.S.C. § 112, second paragraph.

Claims 34-39 are rejected under 35 U.S.C. § 112, second paragraph.

With respect to claim 29, Applicant has added features of the aspirated smoke detector system to the body of the claim in order to more clearly explain how the structural limitations of the claim are interrelated and clarify the operation of the method.

With respect to claim 34, Applicant has provided line indentation, as requested by the Examiner. It is clear that claim 34 is directed to a smoke detector.

In view of the above, Applicant respectfully requests the Examiner to withdraw these rejections.

Claim Rejections Under 35 U.S.C. § 102 and 103

Claims 29, 30, 32, 34-39 and 43 are rejected under 35 U.S.C. § 102(b) as being unpatentable over Schoenfelder et al. (EP 1 006 500 A2).

Claim 46 is rejected under 35 U.S.C. § 102(b) as being unpatentable over Walters et al. (US 5,388,445).

Claim 29

The amended claims more clearly express the differences of the claimed invention over Schoenfelder et al. It is submitted that Schoenfelder et al. fails to disclose the following features of the claim 29:

a. the presence of a sampling network including one or more sampling holes and an aspirator for drawing air through the sampling network to the detector;

b. any method in the system of Schoenfelder et al. can not therefore relate to detecting blocked holes in the sampling network;

c. comparison of a subsequent flow and a base flow.

In relation to points (a) and (b) claim 29 is a method applicable to an air sampling smoke detection system, in which air is drawn from an environment being monitored. The environment can be remote from the detector itself. Air from the environment is drawn through sampling holes (also called sampling points in the specificaiton) into a pipe that forms part of an air sampling network that is coupled to the detector.

On the other hand, Schoenfelder et al. relates to a system including a number of "point" or "spot" smoke detectors. These detectors only detect smoke in a region around the detector housing. As stated in the Abstract of Schoenfelder et al. "The aspiration unit causes ambient air from a region directly adjacent to the detector to flow into the sensing region of the sensor". Thus to detect smoke in a large region a plurality of such detectors are needed. As disclosed in Schoenfelder et al. a plurality of detectors 16b are coupled to control element 12 via a bidirectional communication medium 14. To this extent they form a "network" (in that there is a series of interconnected devices) but this is not a "sampling network" as would be understood by a person skilled in the art of aspirated smoke detection. The fact that the "network" of Schoenfelder et al. is for communications and not air sample delivery can be clearly seen at paragraph [0043] that states:

> The Interface circuits 40 coupled to the processor 34a enable the detector 16i to carry out bidirectional communications, via the link 14 with the control element 12. A variety of communications protocols could be implemented on the link 14 without departing from the spirit and scope of the present invention. Where detector 16i communicates wirelessly, circuits 40 could include an RF transceiver.

This is a fundamental difference between the claimed invention and Schoenfelder et al. and consequent on this difference, Schoenfelder et al. does not disclose the features of sampling points or pipes belonging to the sampling network, or any type of method in such a network.

In relation to item (c) the applicant submits that Schoenfelder et al. fails to disclose determining a "base flow" instead Schoenfelder et al. teaches determining a "calibration constant". The examiner assumes that this calibration constant is a "base flow" but there is no disclosure in Schoenfelder et al. that this is in fact the case.

The calibration process described in Schoenfelder et al. involves activating the fan, measuring the outputs from the two thermistors and establishing representative parameter values. There is no disclosure that these representative parameter values are flow rates.

This is supported by paragraph [0075] of Schoenfelder et al. which states that a "flow trouble threshold" is established (in fact, calculated as specified in the figure) based on ambient temperature. Thus, the comparison which is made in Schoenfelder et al. is made against a threshold that is calculated based on temperature (and presumably the calibration data) and not a measured "base flow rate" as claimed. Thus Schoenfelder et al. fails to teach or suggest comparing the subsequent flow with the base flow.

Accordingly, claim 29 is novel and inventive over Schoenfelder et al.

Claim 30

Dependent claim 30 is patentable at least due to its dependency from claim 29. Moreover, Applicant disagree with the Examiner that an audible alarm such as siren horns, of

Schoenfelder et al. is an ultrasonic flow sensor. This is simply not correct. A siren horn, as disclosed in Schoenfelder et al.:

(a) does not, and cannot sense flow rate.

(b) does not operate at ultrasonic frequencies.

Ultrasonic does not mean "loud" - The Merriam-Webster Online dictionary defines "ultrasonic" as "having a frequency above the human ear's audibility limit of about 20,000 hertz —used of waves and vibrations". [2]

The siren horn of Schoenfelder et al. is not used for flow sensing, instead Schoenfelder et al. teaches at Col 6 para [0042] that flow is sensed using sensors 38a and 38b. These sensors are thermistors.

Claim 34

Independent claim 34 is novel and inventive for similar reasons to claims 30.

Claims 32, 35-39, and 43

Claims 32, 35-39, and 43 are patentable at least due to their dependency.

Claim 46

The examiner rejects claim 46 on the basis of Walters et al.

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[2] See: "ultrasonic." Merriam-Webster Online Dictionary. 2010.

Merriam-Webster Online. 22 July 2010
http://www.merriam-webster.com/dictionary/ultrasonic

Claim 46 has been amended, to clarify that the signals generated in the method are ultrasonic signals (see above for an explanation of "ultrasonic", and also to clarify the nature of the comparison performed between the first and second received signals in the claimed invention.

Walters discloses a method of "detecting a wave front caused by the onset of leaks or other transient events in a pipeline" and a "method to "determine the arrival time and/or amplitude of the wave front" Col 1 line 15 to 22.

The examiner will note the amendment to the claims in which "emitted" is changed to "generated" to clarify that the generation of the wave is part of the claimed process. Support for this amendment can be found in paragraph [0145] of US2007/0084286. In view of this amendment the examiner's attention is drawn to the applicant's previous responses, and reiterates that Walters et al. fails to teach "generating" any relevant signals.

The examiner will also note that the claim has been limited to the generation of **ultrasonic signals**. Walters et al. does not use or detect ultrasonic signals. Moreover the system of Walters et al. is entirely unsuited to using ultrasonic signals.

The system described in Walters et al. could only be sensitive to signals having a frequency **less than 500Hz** because it taught to be operating at a maximum sampling frequency of 1000Hz – column 11 line 68. Some versions of the system of Walters et al would only be sensitive to frequencies less than 50Hz (i.e. half the sampling frequency of 100Hz – which is also disclosed at column 11 line 68 of Walters et al.)

Although the applicant does not agree with the examiner's interpretation of Walters et al., even if that interpretation is adopted Walters et al. does not teach *calculating the difference*

between ***a value of the first received signal*** *at* ***a time*** *and* ***a value of the second received*** *signal* ***at a corresponding time*** *for each point of occurrence of the characteristic waveform feature within the first received signal;*

The "waveforms" are entirely ignored in Walters (by smoothing them with a line of best fit) and Walters et al. therefore never calculates a difference between two received signals. Moreover, because the system of Walters et al. only receives one continuous signal Walters et al. does not ever receive two signals that cover corresponding times.

Claim Rejections Under 35 U.S.C. § 103

Claims 1-9, 11, 13-26, 41 and 46 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Walters in view of Feller (US 6,178,827).

Claim 12 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Walters in view of Feller and Hill et al. (US 5,131,052).

Claims 27, 28, 33 and 42 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Schoenfelder in view of Walters.

Claims 1 and 14

Applicant submits that the disclosure of Walters et al and that of Fellers are incompatible, and would not be combined by one or ordinary skill in the art. As noted above, Walters et al. deals with signals having a frequency less than 500Hz, whereas Feller generates signals having a carrier frequency of 4 million Hz. The signal frequency of Fellers is almost 10,000 times that of the highest frequency signal that Walters et al. can handle. This is a serious incompatibility between the citations.

Moreover, Applicants do not agree with the Examiner's interpretation of Walters et al. for the reasons stated in the previous response, and for the reasons set out above.

Furthermore, claim 1 is amended to more clearly point out the differences between the present invention and Walters et al. In addition to the differences discussed in the Applicant's previous submissions, amended claim 1 includes a step of

> *determining a time of reception of the introduced waveform feature modification in the second ultrasonic signal by comparing* ***the waveform of the first received signal*** *to the* ***waveform of the second ultrasonic signal*** *and determining a point of diversion between corresponding characteristic waveform features of the first and second received signals comprising super positioning said first and second received signals;*

The comparison made in the claimed invention is between ***the waveform of the first received signal*** and the ***waveform of the second ultrasonic signal***. No similar comparison is made in Walters et al. In Walters et al. any "waveform" of the received signal is entirely ignored (by smoothing them with a line of best fit) and a comparison between these lines is performed. Walters et al. therefore never compares the two received signals.

The arguments in relation to claim 1 also apply to claim 14. Claim 14 has also been clarified to more distinctly point out the nature of the comparison between the two received signals that is performed in the claimed invention. Thus claim 14 includes the feature of:

> scanning through said the first received signal and the second received signal in time to determine a point of diversion between a **characteristic waveform feature of the first received signal** and **a corresponding characteristic waveform feature of the second received signals**, wherein said point of diversion corresponds to a time of reception of the introduced waveform feature modification at the receiver;

The relevant comparison is between **characteristic waveform feature of the first received signal** and **a corresponding characteristic waveform feature of the second received**

signals. This is unlike any comparison performed in Walters et al. which does not in any way consider the **waveform** of a received signal.

Claims 2-9, 11, 13, 15-26, and 41

It is submitted that the claims 2-9, 11, 13, 15-26, and 41 are patentable at least by virtue of their dependence on a patentable base claim.

Claim 46

Independent claim 46 is patentable at least for the reasons discussed above with respect to claims 1 and 14, as well as the arguments with respect to the rejection of claim 46 as not being anticipated by Walters.

Claim 12

Dependent claim 12 is patentable at least due to its dependency from claim 1. Moreover, A person skilled in the art would immediately disregard the teaching of Hill et al. and not combine it with the other Walters et al or Feller. As previously noted Hill et al. does not actually teach a loud speaker operating in the range of 150kHz to 6kHz as alleged by the examiner. Hill teaches a loudspeaker which can operate in a range of **150 hertz to 6000 hertz**. The value of 150kHz is an obvious typographical error in Hill et al.

Claims 27, 28, 33, and 43

The Examiner alleges that claim 27, 28, 33 and 43 are obvious in view of Schoenfelder et al in view of Walters et al.

Applicant respectfully submits that these claims are patentable at least due to their dependencies. Moreover, Applicant disagrees for the following reasons:

Schoenfelder et al. fails to disclose determining a "base flow" instead Schoenfelder et al. teaches determining a "calibration constant". The examiner assumes that this calibration constant is a "base flow" but there is no disclosure in Schoenfelder et al. that this is in fact the case.

The calibration process described in Schoenfelder et al. involves activating the fan, measuring the outputs from the two thermistors and establishing representative parameter values. There is no disclosure that these representative parameter values are flow rates.

This is supported by paragraph [0075] of Schoenfelder et al. which states that a "flow trouble threshold" is established (in fact, calculated as specified in the figure) based on ambient temperature. Thus, the comparison which is made in Schoenfelder et al. is made against a threshold that is calculated based on temperature (and presumably the calibration data) and not a measured "base flow rate" as claimed. Thus Schoenfelder et al. fails to teach or suggest comparing the subsequent flow with the base flow.

In addition to the shortcomings of Schoenfelder mentioned above, it is submitted that there is no teaching that the claimed flow calculation can be performed by Schoenfelder (or Walters).

Schoenfelder measures flow using thermal means, as discussed above. Thermal flow sensors operate by transferring heat to the fluid and the rate of cooling of the flow sensor correlates with flow rate. The rate of cooling is a function of how much mass moves past the sensor, not what volume of material moves past it. This type of measurement generates a **mass flow rate** – i.e. a flow rate that indicates the amount of mass passing a point in a given time, which might be measured in kgs^{-1}. The claim is limited to a calculation using **a volumetric flow**

rate. A volumetric flow indicates what volume of air is passing a point over a given time, e.g. as measured in Ls^{-1}.

Mass flow and volume flow are different and mass flow will vary with things like temperature and density, whereas volumetric flow will not vary in this way.

Walters does not remedy any of the deficiencies of Schoenfelder in this regard. Moreover it is noted that the claimed calculation includes signals transmitted in a forward direction and reverse direction – this feature additional is not taught by Walters et al.

Conclusion

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,

/John M. Bird/

John M. Bird
Registration No. 46,027

SUGHRUE MION, PLLC
Telephone: (202) 293-7060
Facsimile: (202) 293-7860

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23373
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Date: July 22, 2010